

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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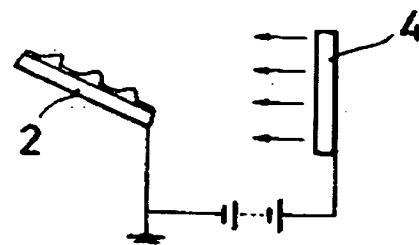
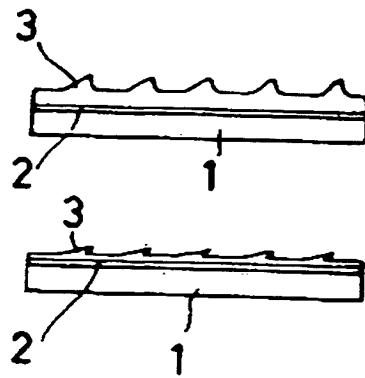
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APPLICATION NUMBER : 54095195

APPLICANT : SHARP CORP;

INVENTOR : TODA KIYOSHI;

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TITLE : PRODUCTION OF LIQUID CRYSTAL  
DISPLAY ELEMENT



ABSTRACT : PURPOSE: To produce a liquid crystal display element of good display grade by sputtering ion beams to the orientation film formed on an electrode surface by a diagonal vapor deposition method thereby decreasing the angle of orientation of said orientation film.

CONSTITUTION: Material of SiO or MgF<sub>2</sub> is diagonally evaporated to a substrate 1 provided with an electrode 2, at about 10<sup>-5</sup> Torr-degree of vacuum and about 85~89° incident angle to the substrate, whereby an orientation film 3 is formed (the orientation film of superior degree of orientation order S is obtained at about 20~30° orientation angle  $\theta$ ). Next, this is supported with inclination to an ion beam source 4 and is subjected to ion beam etching under conditions of about 10<sup>-3</sup>~10<sup>-5</sup> Torr vacuum degree and about 60~90° incident angle to the substrate, so that the orientation angle  $\theta$  is made about  $\leq 3^\circ$ . The electrode plate having the orientation film formed in the above-mentioned manner (small in orientation angle and superior in the degree of order) is particularly suited for liquid crystal display elements of high duty.

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